

We claim:

5 1. A continuously operated process for the purification by distillation of the oxirane formed in the oxirane synthesis by reaction of a hydroperoxide with an organic compound, wherein the crude oxirane is separated in a dividing wall column into low-, intermediate- and high-boiling fractions and the oxirane is taken off as intermediate boiler at the side offtake.

10 2. A process as claimed in claim 1, wherein the dividing wall column is configured as thermally coupled columns.

15 3. A process as claimed in claim 1 or 2, wherein the dividing wall column has from 30 to 120 theoretical plates.

20 4. A process as claimed in any of claims 1 to 3, wherein the distillation is carried out at a temperature of from 35 to 110°C and a pressure of from 1 to 10 bar, with the temperature being measured at the side offtake and the pressure being measured at the top of the column.

25 5. A process as claimed in any of claims 1 to 4, wherein no impurity is present in the oxirane in a concentration of above 0.1% by weight or the sum of all impurities is not greater than 0.1% by weight.

30 6. A process as claimed in any of claims 1 to 5, wherein the oxirane is prepared by a process comprising at least the steps (i) to (iii):

35 (i) reaction of the hydroperoxide with the organic compound to give a product mixture comprising the reacted organic compound and unreacted hydroperoxide,

 (ii) separation of the unreacted hydroperoxide from the mixture resulting from step (i),

 (iii) reaction of the hydroperoxide which has been separated off in step (ii) with the organic compound.

7. A process as claimed in claim 6, wherein an isothermal fixed-bed reactor is used in step (i), an adiabatic fixed-bed reactor is used in step (iii) and a separation apparatus is used in step (ii).
- 5 8. A process as claimed in any of claims 1 to 7, wherein the hydroperoxide used is hydrogen peroxide and the organic compound used is propylene and the reaction occurs over a heterogeneous catalyst to form propylene oxide as oxirane.
- 10 9. A process as claimed in claim 8, wherein the heterogeneous catalyst used is the zeolite TS-1.
10. An apparatus for carrying out a continuously operated process for the purification by distillation of the oxirane formed in the oxirane synthesis by reaction of a hydroperoxide with an organic compound, which comprises at least one isothermal reactor and one adiabatic reactor as well as a separation apparatus for preparing the oxirane as defined in claim 7 and a dividing wall column for purifying the oxirane by distillation.